

Writing the title and abstract for a research paper: Being concise, precise, and meticulous is the key

ABSTRACT

This article deals with formulating a suitable title and an appropriate abstract for an original research paper. The “title” and the “abstract” are the “initial impressions” of a research article, and hence they need to be drafted correctly, accurately, carefully, and meticulously. Often both of these are drafted after the full manuscript is ready. Most readers read only the title and the abstract of a research paper and very few will go on to read the full paper. The title and the abstract are the most important parts of a research paper and should be pleasant to read. The “title” should be descriptive, direct, accurate, appropriate, interesting, concise, precise, unique, and should not be misleading. The “abstract” needs to be simple, specific, clear, unbiased, honest, concise, precise, stand-alone, complete, scholarly, (preferably) structured, and should not be misrepresentative. The abstract should be consistent with the main text of the paper, especially after a revision is made to the paper and should include the key message prominently. It is very important to include the most important words and terms (the “keywords”) in the title and the abstract for appropriate indexing purpose and for retrieval from the search engines and scientific databases. Such keywords should be listed after the abstract. One must adhere to the instructions laid down by the target journal with regard to the style and number of words permitted for the title and the abstract.

Key words: Abbreviations; aims; article; author; conclusions; database; indexing; keywords; manuscript; medical writing; message; methods; paper; research; results; summary

Introduction

This article deals with drafting a suitable “title” and an appropriate “abstract” for an original research paper. Because the “title” and the “abstract” are the “initial impressions” or the “face” of a research article, they need to be drafted correctly, accurately, carefully, meticulously, and consume time and energy.^[1-10] Often, these are drafted after the complete manuscript draft is ready.^[2-5,9-11] Most readers will read only the title and the abstract of a published research paper, and very few “interested ones” (especially, if the paper is of use to them) will go on to read the full paper.^[1,2] One must remember to adhere to the instructions laid down by the

“target journal” (the journal for which the author is writing) regarding the style and number of words permitted for the title and the abstract.^[2,4,5,7-9,12] Both the title and the abstract are the most important parts of a research paper – for editors (to decide whether to process the paper for further review), for reviewers (to get an initial impression of the paper), and for the readers (as these may be the only parts of the paper available freely and hence, read widely).^[4,8,12] It may be worth for the novice author to browse through titles and abstracts of several prominent journals (and their target journal as well) to learn more about the wording and styles of the titles and abstracts, as well as the aims and scope of the particular journal.^[5,7,9,13]

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How to cite this article: Tullu MS. Writing the title and abstract for a research paper: Being concise, precise, and meticulous is the key. Saudi J Anaesth 2019;13:S12-7.

Access this article online	
Website: www.saudija.org	Quick Response Code 
DOI: 10.4103/sja.SJA_685_18	

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The Title

The details of the title are discussed under the subheadings of importance, types, drafting, and checklist.

Importance of the title

When a reader browses through the table of contents of a journal issue (hard copy or on website), the title is the “first detail” or “face” of the paper that is read.^[2-6,13] Hence, it needs to be simple, direct, accurate, appropriate, specific, functional, interesting, attractive/appealing, concise/brief, precise/focused, unambiguous, memorable, captivating, informative (enough to encourage the reader to read further), unique, catchy, and it should not be misleading.^[1-6,9,12] It should have “just enough details” to arouse the interest and curiosity of the reader so that the reader then goes ahead with studying the abstract and then (if still interested) the full paper.^[1,2,4,13] Journal websites, electronic databases, and search engines use the words in the title and abstract (the “keywords”) to retrieve a particular paper during a search; hence, the importance of these words in accessing the paper by the readers has been emphasized.^[3-6,12,14] Such important words (or keywords) should be arranged in appropriate order of importance as per the context of the paper and should be placed at the beginning of the title (rather than the later part of the title, as some search engines like Google may just display only the first six to seven words of the title).^[3,5,12] Whimsical, amusing, or clever titles, though initially appealing, may be missed or misread by the busy reader and very short titles may miss the essential scientific words (the “keywords”) used by the indexing agencies to catch and categorize the paper.^[1,3,4,9] Also, amusing or hilarious titles may be taken less seriously by the readers and may be cited less often.^[4,15] An excessively long or complicated title may put off the readers.^[3,9] It may be a good idea to draft the title after the main body of the text and the abstract are drafted.^[2-5]

Types of titles

Titles can be descriptive, declarative, or interrogative. They can also be classified as nominal, compound, or full-sentence titles.

Descriptive or neutral title

This has the essential elements of the research theme, that is, the patients/subjects, design, interventions, comparisons/control, and outcome, but does not reveal the main result or the conclusion.^[3,4,12,16] Such a title allows the reader to interpret the findings of the research paper in an impartial manner and with an open mind.^[3] These titles also give complete information about the contents of the article, have several keywords (thus increasing the visibility of the article in search engines), and have increased chances of being read

and (then) being cited as well.^[4] Hence, such descriptive titles giving a glimpse of the paper are generally preferred.^[4,16]

Declarative title

This title states the main finding of the study in the title itself; it reduces the curiosity of the reader, may point toward a bias on the part of the author, and hence is best avoided.^[3,4,12,16]

Interrogative title

This is the one which has a query or the research question in the title.^[3,4,16] Though a query in the title has the ability to sensationalize the topic, and has more downloads (but less citations), it can be distracting to the reader and is again best avoided for a research article (but can, at times, be used for a review article).^[3,6,16,17]

From a sentence construct point of view, titles may be *nominal* (capturing only the main theme of the study), *compound* (with subtitles to provide additional relevant information such as context, design, location/country, temporal aspect, sample size, importance, and a provocative or a literary; for example, see the title of this review), or *full-sentence* titles (which are longer and indicate an added degree of certainty of the results).^[4,6,9,16] Any of these constructs may be used depending on the type of article, the key message, and the author's preference or judgement.^[4]

Drafting a suitable title

A stepwise process can be followed to draft the appropriate title. The author should describe the paper in about three sentences, avoiding the results and ensuring that these sentences contain important scientific words/keywords that describe the main contents and subject of the paper.^[1,4,6,12] Then the author should join the sentences to form a single sentence, shorten the length (by removing redundant words or adjectives or phrases), and finally edit the title (thus drafted) to make it more accurate, concise (about 10–15 words), and precise.^[1,3-5,9] Some journals require that the study design be included in the title, and this may be placed (using a colon) after the primary title.^[2-4,14] The title should try to incorporate the Patients, Interventions, Comparisons and Outcome (PICO).^[3] The place of the study may be included in the title (if absolutely necessary), that is, if the patient characteristics (such as study population, socioeconomic conditions, or cultural practices) are expected to vary as per the country (or the place of the study) and have a bearing on the possible outcomes.^[3,6] Lengthy titles can be boring and appear unfocused, whereas very short titles may not be representative of the contents of the article; hence, optimum length is required to ensure that the title explains the main theme and content of the manuscript.^[4,5,9] Abbreviations (except the standard or commonly interpreted ones such as HIV, AIDS, DNA, RNA,

CDC, FDA, ECG, and EEG) or acronyms should be avoided in the title, as a reader not familiar with them may skip such an article and nonstandard abbreviations may create problems in indexing the article.^[3-6,9,12] Also, too much of technical jargon or chemical formulas in the title may confuse the readers and the article may be skipped by them.^[4,9] Numerical values of various parameters (stating study period or sample size) should also be avoided in the titles (unless deemed extremely essential).^[4] It may be worthwhile to take an opinion from an impartial colleague before finalizing the title.^[4-6] Thus, multiple factors (which are, at times, a bit conflicting or contrasting) need to be considered while formulating a title, and hence this should not be done in a hurry.^[4,6] Many journals ask the authors to draft a “short title” or “running head” or “running title” for printing in the header or footer of the printed paper.^[3,12] This is an abridged version of the main title of up to 40–50 characters, may have standard abbreviations, and helps the reader to navigate through the paper.^[3,12,14]

Checklist for a good title

Table 1 gives a checklist/useful tips for drafting a good title for a research paper.^[1-6,12] Table 2 presents some of the titles used by the author of this article in his earlier research papers, and the appropriateness of the titles has been commented upon. As an individual exercise, the reader may try to improvise upon the titles (further) after reading the corresponding abstract and full paper.

The Abstract

The details of the abstract are discussed under the subheadings of importance, types, drafting, and checklist.

Table 1: Checklist/useful tips for drafting a good title for a research paper

The title needs to be simple and direct
It should be interesting and informative
It should be specific, accurate, and functional (with essential scientific “keywords” for indexing)
It should be concise, precise, and should include the main theme of the paper
It should not be misleading or misrepresentative
It should not be too long or too short (or cryptic)
It should avoid whimsical or amusing words
It should avoid nonstandard abbreviations and unnecessary acronyms (or technical jargon)
Title should be SPICED, that is, it should include Setting, Population, Intervention, Condition, End-point, and Design
Place of the study and sample size should be mentioned only if it adds to the scientific value of the title
Important terms/keywords should be placed in the beginning of the title
Descriptive titles are preferred to declarative or interrogative titles
Authors should adhere to the word count and other instructions as specified by the target journal

Importance of the abstract

The abstract is a summary or synopsis of the full research paper and also needs to have similar characteristics like the title. It needs to be simple, direct, specific, functional, clear, unbiased, honest, concise, precise, self-sufficient, complete, comprehensive, scholarly, balanced, and should not be misleading.^[1-3,7-11,13,17] Writing an abstract is to extract and summarize (AB – absolutely, STR – straightforward, ACT – actual data presentation and interpretation).^[17] The title and abstracts are the only sections of the research paper that are often freely available to the readers on the journal websites, search engines, and in many abstracting agencies/databases, whereas the full paper may attract a payment per view or a fee for downloading the pdf copy.^[1-3,7,8,10,11,13,14] The abstract is an independent and stand-alone (that is, well understood without reading the full paper) section of the manuscript and is used by the editor to decide the fate of the article and to choose appropriate reviewers.^[2,7,10,12,13] Even the reviewers are initially supplied only with the title and the abstract before they agree to review the full manuscript.^[7,13] This is the second most commonly read part of the manuscript, and therefore it should reflect the contents of the main text of the paper accurately and thus act as a “real trailer” of the full article.^[2,7,11] The readers will go through the full paper only if they find the abstract interesting and relevant to their practice; else they may skip the paper if the abstract is unimpressive.^[7-10,13] The abstract needs to highlight the selling point of the manuscript and succeed in luring the reader to read the complete paper.^[3,7] The title and the abstract should be constructed using keywords (key terms/important words) from all the sections of the main text.^[12] Abstracts are also used for submitting research papers to a conference for consideration for presentation (as oral paper or poster).^[9,13,17] Grammatical and typographic errors reflect poorly on the quality of the abstract, may indicate carelessness/casual attitude on part of the author, and hence should be avoided at all times.^[9]

Types of abstracts

The abstracts can be structured or unstructured. They can also be classified as descriptive or informative abstracts.

Structured and unstructured abstracts

Structured abstracts are followed by most journals, are more informative, and include specific subheadings/subsections under which the abstract needs to be composed.^[1,7-11,13,17,18] These subheadings usually include context/background, objectives, design, setting, participants, interventions, main outcome measures, results, and conclusions.^[1] Some journals stick to the standard IMRAD format for the structure of the abstracts, and the subheadings would include Introduction/Background, Methods, Results, And (instead of Discussion)

Table 2: Some titles used by author of this article in his earlier publications and remark/comment on their appropriateness

Title	Comment/remark on the contents of the title
Comparison of Pediatric Risk of Mortality III, Pediatric Index of Mortality 2, and Pediatric Index of Mortality 3 Scores in Predicting Mortality in a Pediatric Intensive Care Unit	Long title (28 words) capturing the main theme; site of study is mentioned
A Prospective Antibacterial Utilization Study in Pediatric Intensive Care Unit of a Tertiary Referral Center	Optimum number of words capturing the main theme; site of study is mentioned
Study of Ventilator-Associated Pneumonia in a Pediatric Intensive Care Unit	The words "study of" can be deleted
Clinical Profile, Co-Morbidities & Health Related Quality of Life in Pediatric Patients with Allergic Rhinitis & Asthma	Optimum number of words; population and intervention mentioned
Benzathine Penicillin Prophylaxis in Children with Rheumatic Fever (RF)/Rheumatic Heart Disease (RHD): A Study of Compliance	Subtitle used to convey the main focus of the paper. It may be preferable to use the important word "compliance" in the beginning of the title rather than at the end. Abbreviations RF and RHD can be deleted as corresponding full forms have already been mentioned in the title itself
Performance of PRISM (Pediatric Risk of Mortality) Score and PIM (Pediatric Index of Mortality) Score in a Tertiary Care Pediatric ICU	Abbreviations used. "ICU" may be allowed as it is a commonly used abbreviation. Abbreviations PRISM and PIM can be deleted as corresponding full forms are already used in the title itself
Awareness of Health Care Workers Regarding Prophylaxis for Prevention of Transmission of Blood-Borne Viral Infections in Occupational Exposures	Slightly long title (18 words); theme well-captured
Isolated Infective Endocarditis of the Pulmonary Valve: An Autopsy Analysis of Nine Cases	Subtitle used to convey additional details like "autopsy" (i.e., postmortem analysis) and "nine" (i.e., number of cases)
Atresia of the Common Pulmonary Vein - A Rare Congenital Anomaly	Subtitle used to convey importance of the paper/rarity of the condition
Psychological Consequences in Pediatric Intensive Care Unit Survivors: The Neglected Outcome	Subtitle used to convey importance of the paper and to make the title more interesting
Rheumatic Fever and Rheumatic Heart Disease: Clinical Profile of 550 patients in India	Number of cases (550) emphasized because it is a large series; country (India) is mentioned in the title - will the clinical profile of patients with rheumatic fever and rheumatic heart disease vary from country to country? May be yes, as the clinical features depend on the socioeconomic and cultural background
Neurological Manifestations of HIV Infection	Short title; abbreviation "HIV" may be allowed as it is a commonly used abbreviation
Krabbe Disease - Clinical Profile	Very short title (only four words) - may miss out on the essential keywords required for indexing
Experience of Pediatric Tetanus Cases from Mumbai	City mentioned (Mumbai) in the title - one needs to think whether it is required in the title

the Conclusion/s.^[1,2,7-13,17,18] Structured abstracts are more elaborate, informative, easy to read, recall, and peer-review, and hence are preferred; however, they consume more space and can have same limitations as an unstructured abstract.^[7,9,18] The structured abstracts are (possibly) better understood by the reviewers and readers. Anyway, the choice of the type of the abstract and the subheadings of a structured abstract depend on the particular journal style and is not left to the author's wish.^[7,10,12] Separate subheadings may be necessary for reporting meta-analysis, educational research, quality improvement work, review, or case study.^[11] Clinical trial abstracts need to include the essential items mentioned in the CONSORT (Consolidated Standards Of Reporting Trials) guidelines.^[7,9,14,19] Similar guidelines exist for various other types of studies, including observational studies and for studies of diagnostic accuracy.^[20,21] A useful resource for the above guidelines is available at www.equator-network.org (Enhancing the QUALity and Transparency Of health Research). Unstructured (or non-structured) abstracts are free-flowing, do

not have predefined subheadings, and are commonly used for papers that (usually) do not describe original research.^[1,7,9,10]

The four-point structured abstract: This has the following elements which need to be properly balanced with regard to the content/matter under each subheading:^[9]

Background and/or Objectives: This states why the work was undertaken and is usually written in just a couple of sentences.^[3,7-10,12,13] The hypothesis/study question and the major objectives are also stated under this subheading.^[3,7-10,12,13]

Methods: This subsection is the longest, states what was done, and gives essential details of the study design, setting, participants, blinding, sample size, sampling method, intervention/s, duration and follow-up, research instruments, main outcome measures, parameters evaluated, and how the outcomes were assessed or analyzed.^[3,7-10,12-14,17]

Results/Observations/Findings: This subheading states what was found, is longer, is difficult to draft, and needs to mention important details including the number of study participants, results of analysis (of primary and secondary objectives), and include actual data (numbers, mean, median, standard deviation, “P” values, 95% confidence intervals, effect sizes, relative risks, odds ratio, etc.).^[3,7-10,12-14,17]

Conclusions: The take-home message (the “so what” of the paper) and other significant/important findings should be stated here, considering the interpretation of the research question/hypothesis and results put together (without overinterpreting the findings) and may also include the author’s views on the implications of the study.^[3,7-10,12-14,17]

The eight-point structured abstract: This has the following eight subheadings – Objectives, Study Design, Study Setting, Participants/Patients, Methods/Intervention, Outcome Measures, Results, and Conclusions.^[3,9,18] The instructions to authors given by the particular journal state whether they use the four- or eight-point abstract or variants thereof.^[3,14]

Descriptive and Informative abstracts

Descriptive abstracts are short (75–150 words), only portray what the paper contains without providing any more details; the reader has to read the full paper to know about its contents and are rarely used for original research papers.^[7,10] These are used for case reports, reviews, opinions, and so on.^[7,10] Informative abstracts (which may be structured or unstructured as described above) give a complete detailed summary of the article contents and truly reflect the actual research done.^[7,10]

Drafting a suitable abstract

It is important to religiously stick to the instructions to authors (format, word limit, font size/style, and subheadings) provided by the journal for which the abstract and the paper are being written.^[7-10,13] Most journals allow 200–300 words for formulating the abstract and it is wise to restrict oneself to this word limit.^[1-3,7-13,22] Though some authors prefer to draft the abstract initially, followed by the main text of the paper, it is recommended to draft the abstract in the end to maintain accuracy and conformity with the main text of the paper (thus maintaining an easy linkage/alignment with title, on one hand, and the introduction section of the main text, on the other hand).^[2,7,9-11] The authors should check the subheadings (of the structured abstract) permitted by the target journal, use phrases rather than sentences to draft the content of the abstract, and avoid passive voice.^[1,7,9,12] Next, the authors need to get rid of redundant words and edit the abstract (extensively) to the correct word count permitted (every word in the abstract “counts”).^[7-10,13] It

is important to ensure that the key message, focus, and novelty of the paper are not compromised; the rationale of the study and the basis of the conclusions are clear; and that the abstract is consistent with the main text of the paper.^[1-3,7,9,11-14,17,22] This is especially important while submitting a revision of the paper (modified after addressing the reviewer’s comments), as the changes made in the main (revised) text of the paper need to be reflected in the (revised) abstract as well.^[2,10,12,14,22] Abbreviations should be avoided in an abstract, unless they are conventionally accepted or standard; references, tables, or figures should not be cited in the abstract.^[7,9-11,13] It may be worthwhile not to rush with the abstract and to get an opinion by an impartial colleague on the content of the abstract; and if possible, the full paper (an “informal” peer-review).^[1,7-9,11,17] Appropriate “Keywords” (three to ten words or phrases) should follow the abstract and should be preferably chosen from the Medical Subject Headings (MeSH) list of the U.S. National Library of Medicine (<https://meshb.nlm.nih.gov/search>) and are used for indexing purposes.^[2,3,11,12] These keywords need to be different from the words in the main title (the title words are automatically used for indexing the article) and can be variants of the terms/phrases used in the title, or words from the abstract and the main text.^[3,12] The ICMJE (International Committee of Medical Journal Editors; <http://www.icmje.org/>) also recommends publishing the clinical trial registration number at the end of the abstract.^[7,14]

Checklist for a good abstract

Table 3 gives a checklist/useful tips for formulating a good abstract for a research paper.^[1-3,7-14,17,22]

Table 3: Checklist/useful tips for formulating a good abstract for a research paper

The abstract should have simple language and phrases (rather than sentences)
It should be informative, cohesive, and adhering to the structure (subheadings) provided by the target journal. Structured abstracts are preferred over unstructured abstracts
It should be independent and stand-alone/complete
It should be concise, interesting, unbiased, honest, balanced, and precise
It should not be misleading or misrepresentative; it should be consistent with the main text of the paper (especially after a revision is made)
It should utilize the full word capacity allowed by the journal so that most of the actual scientific facts of the main paper are represented in the abstract
It should include the key message prominently
It should adhere to the style and the word count specified by the target journal (usually about 250 words)
It should avoid nonstandard abbreviations and (if possible) avoid a passive voice
Authors should list appropriate “keywords” below the abstract (keywords are used for indexing purpose)

Concluding Remarks

This review article has given a detailed account of the importance and types of titles and abstracts. It has also attempted to give useful hints for drafting an appropriate title and a complete abstract for a research paper. It is hoped that this review will help the authors in their career in medical writing.

Acknowledgement

The author thanks Dr. Hemant Deshmukh - Dean, Seth G.S. Medical College & KEM Hospital, for granting permission to publish this manuscript.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Author Help: Online submission of the manuscripts

Articles can be submitted online from <http://www.journalonweb.com>. For online submission, the articles should be prepared in two files (first page file and article file). Images should be submitted separately.

- First Page File:**
Prepare the title page, covering letter, acknowledgement etc. using a word processor program. All information related to your identity should be included here. Use text/rtf/doc/pdf files. Do not zip the files.
- Article File:**
The main text of the article, beginning with the Abstract to References (including tables) should be in this file. Do not include any information (such as acknowledgement, your names in page headers etc.) in this file. Use text/rtf/doc/pdf files. Do not zip the files. Limit the file size to 1 MB. Do not incorporate images in the file. If file size is large, graphs can be submitted separately as images, without their being incorporated in the article file. This will reduce the size of the file.
- Images:**
Submit good quality color images. Each image should be less than 4096 kb (4 MB) in size. The size of the image can be reduced by decreasing the actual height and width of the images (keep up to about 6 inches and up to about 1800 x 1200 pixels). JPEG is the most suitable file format. The image quality should be good enough to judge the scientific value of the image. For the purpose of printing, always retain a good quality, high resolution image. This high resolution image should be sent to the editorial office at the time of sending a revised article.
- Legends:**
Legends for the figures/images should be included at the end of the article file.